

Notes on some Alticinae of a dune wood vegetation (with a description of the male and female genitalia of two *Aphthona* species) (Coleoptera : Chrysomelidae)

Peter VERDYCK & Luc DE BRUYN

Samenvatting. Gegevens over enkele Alticinae van een duinbosvegetatie (met beschrijving van de mannelijke en vrouwelijke genitalia van twee *Aphthona* soorten) (Coleoptera : Chrysomelidae)

Een lijst van de tijdens een studie in de Franse duinen gevonden Alticinae (Coleoptera : Chrysomelidae) wordt gegeven, hierbij bespreken we enkele van de meer interessante soorten in detail. Van twee soorten uit het genus *Aphthona* werden genitaalfiguren (aedeagus en spermatheca) getekend. Verder voegen we voor elke soort een lijst van de bekende voedselplanten bij.

Résumé. Données concernant les Alticinae sylvicoles des dunes (avec description des genitalia mâle et femelle de deux espèces d'*Aphthona*) (Coleoptera : Chrysomelidae) Les auteurs donnent une liste des espèces d'Alticinae récoltées durant une étude de la faune des dunes françaises. Ils commentent les plus intéressantes espèces en détail. Les genitalia de deux espèces d'*Aphthona* sont figurées (aedeagus et spermatheca). Les plantes nourricières connues sont mentionnées pour chaque espèce.

Abstract. A list of Alticinae (Coleoptera : Chrysomelidae) caught in a dune-wood vegetation in France is given. The interesting species are discussed more in detail. Figures of the aedeagus and the spermatheca of two *Aphthona* species are given. A compiled list of the host plant records is added.

Verdyck, P. & De Bruyn, L. : Rijksuniversitair Centrum Antwerpen, Laboratorium Algemene Dierkunde, Groenenborgerlaan 171, B-2020 Antwerpen, Belgium.

Introduction

In August 1989 the French coast between Calais and Boulogne was visited to investigate the local entomofauna, and more in particular the phytophagous beetle group Alticinae (Coleoptera : Chrysomelidae). Both larvae and adults feed on a large variety of plant species. Each genus however, has its particular host choice, and only few of them are really and totally polyphagous. Many species have evolved as pests of agricultural crops and ornamental plants.

During our research, our special attention was drawn to a small ($\pm 600 \text{ m}^2$) isolated woodland in the «Dunes de la Slack» between Wimereux and Ambleteuse. The wood was situated in a dip between the dunes. The vegetation was characterised by *Populus* and *Salix* species, with a undergrowth of *Mentha aquatica* L., *Eupatorium cannabinum* L., *Symphytum officinale* L., all typical species for a humid environment. On the wettest spots *Iris pseudacorus* L. was present. This vegetation ended quite abruptly (with at the borders *Cynoglossum officinale* L. and *Senecio jacobaea* L.), before giving rise to the typical dune vegetation of *Hippophae rhamnoides* L. and *Rubus caesius* L.

The beetles were sampled using a sweepnet, pitfall traps and hand collecting from their hostplants. In addition, the collection «E. DERENNE»

and the Belgian collection, both in the «Institut Royal des Sciences Naturelles de Belgique» (R.I.Sc.N.B.) were examined. Genital preparations were made following the technique of SMITH (1979). The nomenclature used is according to MOHR (1966).

Results and Discussion

In all, 79 Alticinae were caught, belonging to 13 different species (table 1). Almost 45% of the specimens are confined to only 1 species (*Longitarsus jacobaeae* (WATERHOUSE, 1858)), and over 70% of the specimens belong to belong to only 30% of the species. From three species only one specimen was found.

Table 1. List of species captured during the present study.

Species	m	f
<i>Longitarsus jacobaeae</i> (WATERHOUSE, 1858)	20	15
<i>Longitarsus symphyti</i> HEIKERTINGER, 1912	4	3
<i>Longitarsus pellucidus</i> (FOUDRAS, 1860)	4	3
<i>Longitarsus succineus</i> (FOUDRAS, 1860)	5	0
<i>Longitarsus parvulus</i> (PAYKULL, 1799)	2	0
<i>Longitarsus ochroleucus</i> (MARSHAM, 1802)	1	1
<i>Phyllotreta exclamationis</i> (THUNBERG, 1784)	1	0
<i>Aphthona euphorbiae</i> (SCHRANK, 1781)	2	0
<i>Aphthona coerulea</i> (GEOFFROY, 1785)	5	3
<i>Sphaeroderma testaceum</i> (FABRICIUS, 1775)	2	3
<i>Chalcoides aurata</i> (MARSHAM, 1802)	1	2
<i>Psyllioides affinis</i> (PAYKULL, 1799)	0	1
<i>Crepidodera transversa</i> (MARSHAM, 1802)	0	1

L. jacobaeae (WATERHOUSE, 1858) is a common, 2.5 - 3.0 mm long beetle with ochreous yellow body and appendages, and a pale underside. Under natural conditions Ragwort (*S. jacobaea* L.) appears to be the only foodplant (HEIKERTINGER 1926a, NEWTON 1933, MOHR 1962, DERENNE 1963, MOHR 1966, BINNS 1975, KEVAN 1967, LESAGE 1988). NEWTON (1933) also tested seven other, related plants, in the laboratory. His results revealed that where 100% survived on *S. jacobaea*, only 80% survived on *S. aquaticus*, while on the six other plants the survival rate even never rose above 50%. Due to its strict host plant specificity, *L. jacobaeae* was introduced in California for the biological control of tansy ragwort, *S. jacobaea* L. (BINNS 1975, SHUTE 1975, LESAGE 1988). According to FRICK (1970a, b) *L. jacobaeae* does not emerge until late July. Throughout late autumn, winter, and spring, the larvae feed on the root crowns and the petioles of the lower leaves. One plant may have up to 95 larvae feeding in its roots and rosettes (HAWKES & JOHNSON 1978). In this way, mature plants can be defoliated completely (BINNS 1975). Under laboratory conditions, individual females were found to lay over 1100 eggs (HAWKES & JOHNSON 1978). *L. jacobaeae* does pass the winter as egg or larva, whereas the majority of the Alticinae hibernate as adults.

L. symphyti HEIKERTINGER, 1912 is a rare species with a preference for wet localities (DERENNE 1963). During our study we found it on the host plant *Symphytum officinale* L.. *L. symphyti* is very similar to *L. succineus* of which

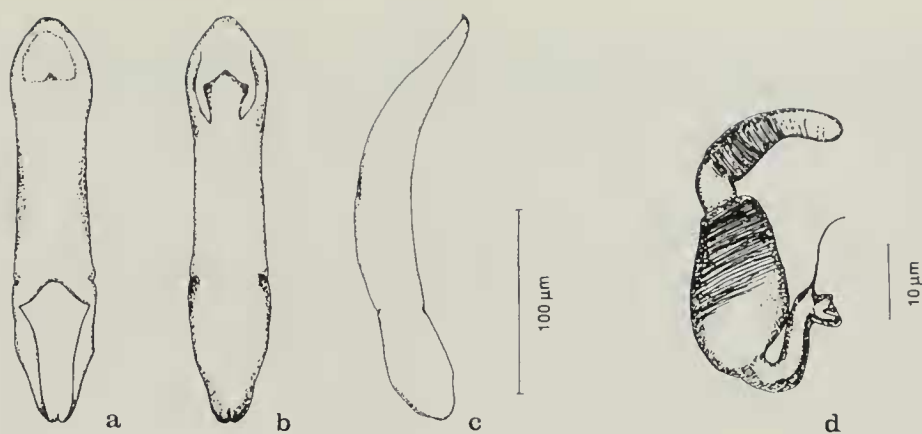


Fig. 1. Genitalia of *Aphthona coerulea*: aedeagus, a. ventral view, b. dorsal view, c. lateral view; d. female spermatheca.

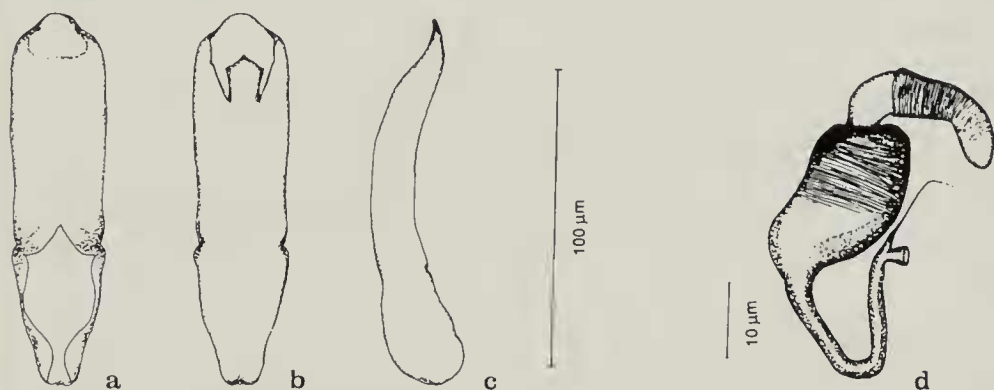


Fig. 3. Genitalia of *Aphthona euphorbiae*: aedeagus, a. ventral view, b. dorsal view, c. lateral view; d. female spermatheca.

it can be distinguished by the structure of the genitalia.

Both *Aphthona* species are very common. In spite of this, the knowledge concerning these species is only scarce. As we did not find the description and figures of the male aedeagi (HEIKERTINGER 1944, MOHR 1966) to be very satisfactory, we decided to formulate a description of the male aedeagi and female spermatheca of both species.

The median lobe of the male aedeagus of *A. coerulea* is slightly curved (fig. 1.c) and triangular at the apex (fig. 1a, b). The female spermatheca is bladder-shaped, broadest at basal third. There are no loops in the short spermathecal duct (fig. 1.d).

The aedeagus of *A. euphorbiae* is much shorter and relatively broader than in *A. coerulea*; nipple shaped at the apex (fig. 2a, b, c). The female spermatheca is bladder shaped, broadest in the middle and has a short neck; no loops in spermathecal duct (which is longer than in *A. coerulea*) (fig. 1.d).

The data concerning the host plant specificity of Alticinae are very scattered in literature. This makes it rather complicated to get a clear view on the host plant range of the respective species. The adjoining list is compiled

from the following authors: LEESBERG 1880, TOMLIN & SHARP 1912, HEIKERTINGER 1926a, 1926b, 1944, MOHR 1960, 1962, DERENNE 1963, MOHR 1966, KEVAN 1967, SCHWENKE 1974, DOGUET & TEMPÈRE 1975, GRUEV 1975, BARTKOWSKA 1976, LESAGE 1988.

L. pellucidus (FOUDRAS) : *Convolvulus arvensis* L., *Inula* sp., *Mentha rotundifolia* (L.), *Mentha* sp., *Trifolium* sp.

L. succineus (FOUDRAS) : *Achillea millefolium* L., *Achillea* sp., *Ammobium elatum* R. Br., *Anthemis* sp., *Artemisia* sp., *A. absinthum* L., *A. campestris* L., *A. vulgaris* L., *Chrysanthemum* sp., *C. leucanthemum* L., *C. morifolium* L., *Cirsium arvense* (L.) Scop., *Convolvulus arvensis* L., *Eupatorium cannabinum* L., *E. cyparissias* L., *Leucanthemum vulgare* Lam., *Plantago lanceolata* L., *P. major* L., *Salvia nemorosa* L., *S. pratensis* L., *Senecio jacobaea* L., *Symphytum officinale* L., *Tanacetum* sp., (?) *Thymus serpyllum* L., *Tussilago farfara* L..

L. parvulus (PAYKULL) : *Linum* sp., *L. usitatissimum* L..

L. ochroleucus (MARSHAM) : Compositae, *Artemisia absinthum* L., *Genista tinctoria* L., *Matricaria* sp., *Senecio* sp..

P. exclamationis (THUNBERG) : Cruciferae, *Nasturtium* sp., *Cardamine* sp..

A. euphorbiae (SCHRANK) : *Beta vulgaris* L., *Euphorbia cyparissias* L., Euphorbiaceae, (?) *Fraxinus* sp., *Linum* sp., *L. usitatissimum* L., (?) *Populus* sp..

A. coerulea (GEOFFROY) : *Iris pseudacorus* L..

S. testaceum (FABRICIUS) : *Carduus* sp., *C. acanthoides* L., *C. crispus* L., *Cirsium* sp., *C. arvense* (L.) Scop., *C. lanceolatum* Scop., *C. oleraceum* Scop., *C. palustre* (L.) Scop., *Serratula* sp..

C. aurata (MARSHAM) : *Populus* sp., *Salix* sp..

P. affinis (PAYKULL) : *Atropa belladonna* L., *Hyoscyamus niger* L., *Lycium halimifolium* Mill., Solanaceae, *Solanum dulcamara* L., *S. nigrum* L., *S. tuberosum* L..

C. transversa (MARSHAM) : *Cirsium* sp., *C. canum* (L.) All., *C. rivulare* (Jack.) All..

At present, the knowledge concerning habitat preference and biology of Alticinae beetles is still only scarce. It is quite striking that even in such a small semi-isolated area already 13 species belonging to the subfamily of the Alticinae are present, which makes it inviting to do some more work on the entomofauna of such areas in the future.

Acknowledgments

We like to thank Prof. Dr. W. DECLEIR and Dr. D. VAN STRYDONCK (Laboratorium voor Biochemie en Algemene Dierkunde, R.U.C.A.), Prof. Dr. J. HULSELMANS (Laboratorium voor Algemene Dierkunde, R.U.C.A.) and the «Station Marine Wimereux, France» for providing us the necessary working facilities.

References

- Binns, E.S., 1975. Adults of *Longitarsus jacobaeae* (L.) (Col., Chrysomelidae) defoliating ragwort (*Senecio jacobaea* L.: Compositae). - *Ent.mon.Mag.* **111** : 1334-1336.
- Bartkowska, J., 1976. Z obserwacji nad wybiorczoscia pokarmowa chrzaszczy roslinozernyck (Coleoptera). - *Polskie Pismo Entomologiczne* **46** : 343-351.
- Derenne, E., 1963. Catalogue des Coléoptères de Belgique. Fasc. IV, Chrysomeloidea: Chrysomelidae. - Imprimerie des Sciences, Bruxelles, 104 p.
- Doguet, S. & Tempère, G., 1975. Contribution à l'étude faunistique et systématique des Alticinae de la faune de France (Col., Chrysomelidae). - *L'Entomologiste* **31** : 220-226.
- Frick, K.E., 1970a. *Longitarsus jacobaeae* (Coleoptera: Chrysomelidae), a flea-beetle for the biological control of Tansy Ragwort. Hostplant specific studies. - *Ann.ent.Soc.Am.* **63** : 284-296.
- Frick, K.E., 1970b. Ragwort flea beetle established for biological control of tansy ragwort in Northern California. - *California Agriculture*, April : 12-13.
- Gruev, B., 1975. Zwei neue Arten der Unterfamilie Halticinae and taxonomische Notizen über *Chalcoides nigricoxis* (Allard, 1878) (Coleoptera, Chrysomelidae). - *Acta Zool. Bulg.* **1** : 89-94.
- Hawkes, R.B. & Johnson, G.R., 1978. *Longitarsus jacobaeae* aids moth in the biological control of tansy ragwort. - *Appl.Ent.* (Series A) **66** : 193-196.
- Heikertinger, F., 1926a. Resultate fünfzehnjähriger Untersuchungen über die Nahrungspflanzen einheimischer Halticinen. - *Entomologische Blätter* **22** : 1-9.
- Heikertinger, F., 1926b. Bestimmungstabelle der Halticinengattung *Psylloides* aus dem paläarktischen Gebiete. - *Coleopterologische Rundschau* **12** : 101-138.
- Heikertinger, F., 1944. Bestimmungstabelle der paläarktischen *Aphthona*-Arten. - *Coleopterologische Rundschau* **30** : 37-124.
- Kevan, D.K., 1967. The British species of the genus *Longitarsus* Latreille (Col., Chrysomelidae). - *Ent.mon.Mag.* **103** : 83-110.
- Leesberg, A.F.A., 1880. Bijdrage tot de kennis der inlandse Halticiden. - *Tijdschr.Ent.* **24** : 169-208.
- LeSage, L., 1988. Notes on european *Longitarsus* species introduced in North America (Coleoptera: Chrysomelidae: Alticinae). - *Can.Ent.* **120** : 1133-1145.
- Mohr, K.H., 1960. Erdflöhe. - A. Ziemsen Verlag, Wittenberg-Lutherstadt, 48 p.
- Mohr, K.H., 1962. Bestimmungstabelle und Faunistik der mitteleuropäischen *Longitarsus*-Arten. - *Entomologische Blätter* **58** : 55-118.
- Mohr, K.H., 1966. 88. Familie Chrysomelidae. - in : Freude, H.; Harde, K.W. & Lohse, G.A. (eds.) Die Käfer Mitteleuropas, Band 9. - Goecke & Evers Verlag, Krefeld, 299 p.
- Newton, H.C.F., 1933. On the biology of some species of *Longitarsus* (Col., Chrysomelidae) living on ragwort. - *Bull.Ent.Res.* **24** : 511-520.
- Schwenke, W., 1974. Die Fortschädlinge europas. - Verlag Paul Parey, Hamburg und Berlin : 202-235.
- Shute, S.L., 1975. *Longitarsus jacobaeae* Waterhouse (Col., Chrysomelidae) : identity and distribution. - *Ent.mon.Mag.* **111** : 33-39.
- Smith, E.M., 1979. Techniques for the dissection and mounting of the male (aedeagus) and female (spermatheca) genitalia of the Chrysomelidae (Coleoptera). - *The Coleopterists Bulletin* **33** : 93-103.
- Tomlin, J.R. & Sharp, W.E., 1912. Notes on the British species of *Longitarsus*, Latr. - *Ent.mon.Mag.* **48** : 200-204, 245-253, 278-286.